

### REMARKS

This is in response to the Office Action mailed on July 7, 2003, in which claims 1-4 and 12-15 were rejected under 35 U.S.C. § 102(e) as being anticipated by Filter et al. (U.S. Pat. No. 6,392,144); and claims 5-11 and 16 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Filter et al. With this Amendment, claim 1 is amended and claims 1-16 remain pending in the present application.

#### Claim Rejections - 35 U.S.C. § 102

Claims 1 and 12 were rejected under 35 U.S.C. § 102(e) as being anticipated by Filter et al. Filter et al. teaches attaching a completed MEMS device 100 formed on a die 12 to a supporting substrate 14. The supporting substrate 14 has pillars 18 that interlock with pillars 16 on die 12. The interlocking of pillars 18 on supporting substrate 14 with pillars 16 on die 12 is a permanent assembly, forming a solderless package containing MEMS device 100.

In contrast, amended claim 1 and claim 12 as originally submitted teach attaching a product wafer having MEMS devices formed thereon to a handle wafer for through-wafer etching of the MEMS devices on the product wafer. In order to reject a claim under § 102(e), the reference must teach each and every limitation of the claims. MPEP 2131; *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 2 USPQ2d 1051 (Fed. Cir. 1987). Filter et al. fails to teach attaching a product wafer having MEMS devices formed thereon to a handle wafer for through-wafer etching of the MEMS devices on the product wafer. In fact, no further processing is performed on the completed package according to the teachings of Filter et al., nor would a through-etching process on MEMS device 100 be appropriate, since the attachment structure 10 would be rendered irrelevant by the through-etching process.

Furthermore, Filter et al. does not teach forming a plurality of MEMS devices on a first side of the product wafer, or, on a side of the product wafer opposite the second structure pattern. Rather, Filter et al. teaches mounting or forming a single device 100 on the same side of die 12 as pillars 16. It is important to note that the explicit teachings of Filter et al. are "applicable to the *packaging* of ICs, microsensors, or multichip modules." Column 16, lines 41-42 (emphasis

added). Thus, the attachment structure 10 of Filter et al. is used in packaging individual devices in a solderless package and, perhaps, for assembling the packages into an multichip circuit 70, as in FIG. 11. If MEMS device 100 was formed on a side opposite of die 12 as pillars 16 (as is required by the present invention), MEMS device 100 would be exposed in a multichip module 70, thereby compromising the safety of the device and preventing the formation of electrical connections 46 of a multichip module 70.

Therefore, because Filter et al. does not teach either attaching a product wafer having MEMS devices formed thereon to a handle wafer for through-wafer etching of the MEMS devices on the product wafer, or forming a plurality of MEMS devices on a side of the product wafer opposite the second structure pattern, the recited elements of claims 1 and 12 are not disclosed by the prior art and the rejections under 35 U.S.C. § 102(e) should accordingly be withdrawn.

Claims 2-4 and 13-15 were rejected under 35 U.S.C. § 102(e) as being anticipated by Filter et al. Claims 2-4 depend from claim 1, and claims 13-15 depend from claim 12. As discussed above, claims 1 and 12 are not anticipated or otherwise taught by Filter et al. Therefore, claims 2-4 and 13-15 are also not anticipated or otherwise taught by Filter et al.

#### Claim Rejections - 35 U.S.C. § 103

Claim 6 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Filter et al. To establish *prima facie* obviousness there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference. MPEP 2143.01; *In re Kotzab*, 217 F.3d 1365 (Fed. Cir. 2000). As the Examiner stated at Page 3 of Paper No. 4, Filter et al. does not teach plasma etching MEMS devices using a through-etching process after the handle wafer and the product wafer are mechanically interconnected, as is required by claim 6. It would not have been obvious to one of ordinary skill in the art to through-etch the attachment structure 10 of Filter et al., which is directed to *packaging* of completed, released MEMS devices, to produce released MEMS devices according to the present invention. That is, the attachment structure 10 of Filter et al. serves a different function than the first structure pattern of the handle wafer and second structure pattern of the product wafer according to

the present invention. In particular, attachment structure 10 is formed to permit attachment of die 12 containing completed, released MEMS device 100 to a supporting substrate 14. This permits the resulting structure to be used as a single solderless packaged MEMS or IC device, or integrated into a multichip circuit, as shown in FIG. 11. On the other hand, the first and second structure patterns of the present invention are formed on the handle and product wafers, respectively, to permit through-etching of the MEMS devices formed on the product wafer for releasing of the MEMS devices from the product wafer, and to provide a place for released devices to collect upon release from the product wafer. The Examiner suggests that Filter et al. teaches through-etching the MEMS device at column 14, lines 48-51. However, Filter et al. only teaches that recesses 62 may be etched through the die 12 to allow "visual alignment of the pegs 60 to the recesses 62 using a microscope." Column 14, lines 52-54.

It also would not be desirable to release MEMS device 100 from die 12 in Filter et al., as is required by the present invention, since this would separate MEMS device 100 attachment structure 10 and permit movement of MEMS device 100 with respect to the solderless package. In other words, pillars 16 would become separated from MEMS device 100, thereby rendering the mechanical connection between pillars 16 and 18 moot, jeopardizing the overall mechanical stability of the device. This would also prevent electrical connections 46 in a multichip module 70 from functioning properly, further compromising the operation of the circuit. If the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. MPEP 2143.01; *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).

Therefore, because there is no suggestion or motivation in Filter et al. or in knowledge generally available to one of ordinary skill in the art to etch MEMS devices using a through-etching process after the handle wafer and the product wafer are mechanically interconnected to release MEMS devices from the product wafer, claim 6 is allowable as originally submitted and favorable reconsideration is respectfully requested.

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Claims 5, 7-11, and 16 were also rejected under 35 U.S.C. § 103(a) as being unpatentable over Filter et al. As discussed above, claims 1, 6, and 12 are now in a condition for allowance. Claim 5 depends from allowable claim 1, claims 7-11 depend from allowable claim 6, and claim 16 depends from allowable claim 12. These claims are also allowable, since any claim depending from a patentable independent claim is also patentable. *In re Fine*, 837 F.2d 1071 (Fed. Cir. 1988).

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**CONCLUSION**

In view of the foregoing, all pending claims 1-16 are in condition for allowance.  
Reconsideration and allowance of all pending claims are respectfully requested.

Respectfully submitted,

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Date: 10/6/03

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